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October 19, 2015

Via E-Mail

Ms. Kristine Koch
Remedial Project Manager
Office of Environmental Cleanup
U.S. Environmental Protection Agency
1200 Sixth Avenue, Suite 900
M/S ECL-122
Seattle, WA 98101-3104

Subject: Input for the National Remedy Review Board Meeting on the Portland Harbor Superfund Site from the RM11E Group

Dear Ms. Koch:

The River Mile 11 East Group (RM11E Group)[1] is providing the following technical comments for the National Remedy Review Board's (NRRB) consideration at its upcoming meeting to discuss the conceptual remedy for the Portland Harbor Superfund Site (PHSS). The RM11E Group's comments are based on the Supplemental Remedial Investigation and Feasibility Study (RI/FS) work that has been and continues to be conducted by the RM11E Group under the 2013 Administrative Settlement Agreement and Order on Consent (AOC) for Supplemental RI/FS Work with EPA (RM11E AOC). Thank you in advance for providing these comments to the NRRB.

Introduction

The RM11E Group is performing its work to supplement the site-wide RI/FS in part because the initial Lower Willamette Group's (LWG) PHSS study area did not include the RM11E area and was not expanded upriver to RM11E until 2008, by which time the LWG was well into development of the RI. The EPA also requested that the RM11E Group conduct the supplemental RI/FS work now because the RM11E area is the farthest upstream area in the PHSS. By gathering additional information on site conditions now, the remedy at the RM11E can begin "expeditiously" following issuance of a Record of Decision (ROD) for the PHSS (RM11E AOC at ¶23).

[1] The RM11E Group consists of Cargill, Inc., CBS Corporation, the City of Portland, DIL Trust, Glacier Northwest, Inc. and PacifiCorp.

Under the RM11E AOC, in 2014 and 2015, the RM11E Group completed a significant amount of additional sampling to refine the previously defined sediment contamination footprint.[2] The RM11E Group also conducted various engineering evaluations to identify implementation issues that will affect remedy selection and design at the RM11E area.[3] The RM11E supplemental sediment data has not been included in the PHSS database used to prepare EPA's current draft FS. Further, the results of the RM11E Implementability Study indicate conflicts between the technology assignment decision trees in EPA's FS and site constraints that could limit implementability of those technologies in the RM11E area.

The RM11E Group has two main issues regarding the cost efficient use of the RM11E supplemental RI/FS information that we would like the NRRB to consider:

1. The Proposed Plan and ROD for Portland Harbor should include, incorporate, and address the RM11E information, collected at EPA's request to expedite design and implementation of the remedy in the RM11E area, in sufficient detail to allow Remedial Design based on this information to proceed without requiring costly and time consuming administrative processes, such as an Explanation of Significant Difference (ESD) or a ROD Amendment.

2. The implementability constraints identified through the RM11E RI/FS-related work provide a case study of the types of physical site constraints that will affect technology assignments during Remedial Design, and will impact cost estimates. Because the implementability constraints for RM11E are already identified and known to EPA, they should be incorporated into the Proposed Plan and ROD, rather than being cast as significant changes from the technology assignment decision trees as those decision trees might be applied to RM11E. The information gathered by the RM11E Group provides a clear example of why flexibility will be needed when making technology decisions to prevent unnecessary remedy delays associated with ESDs or ROD Amendments.

Issues of Concern Raised by the RM11E Group's Supplemental RI/FS Work

This letter highlights issues raised by the RM11E Group's supplemental RI/FS work. It is not intended to be a comprehensive set of comments on EPA's FS or the conceptual remedy for the PHSS.

[2] The majority of the additional sampling is reported in the September 2014 Final Supplemental Remedial Investigation / Feasibility Study Field Sampling and Data Report.

[3] The implementability issues are presented in the July 2015 Draft Implementability Study Report.

1. EPA's FS Does Not Consider Critical Site Factors that will Affect Remedy Selection, Design, and Cost

The RM11E Implementability Study Report (Draft, dated July 2015) began assessing how the current site configuration (e.g., bank slope/stability and structures), human activities (e.g., navigation and commerce), and river dynamics will likely impact the selection and design of a remedy for the RM11E area. The Implementability Study work involved engineering evaluations of slope stability, waterfront structures, river hydrodynamics, debris, and waterfront activities at the site. The Implementability Study work identified 10 physical conditions and site activities, referred to as "site factors," that have a high potential to impact Remedial Design and implementation at RM11E. These 10 high-ranked site factors, their impact on potential remedial actions, and recommendations for addressing them in remedial selection and design, are summarized in Chapter 10 of the Implementability Study Report and the associated figures, which are attached to this letter.

Addressing these site factors will be critical to selecting and designing an implementable and cost-effective remedy for RM11E. An effective remedy will require consideration of significant site factors in order to be implementable and reduce design and construction complexities. Accordingly, the remedies for the RM11E area will need to be developed for defined subareas of the site, and may need to be completed over multiple construction seasons to limit the number of site factors being managed at any one location and time.

The site factors have significant impacts on the "intermediate" and "shallow" areas as defined in EPA's FS, complicating the use of standard remedial technologies in these parts of the RM11E area. Depending on the solutions identified for addressing the site factors, the cost of the remedy could vary substantially from FS cost estimates based on standard remedial technologies. Failing to account for these site factors in remedy selection could result in substantial errors in estimates of the cost of remedial action.

2. The Remedy Selection Process Must Provide for Flexibility in Technology Selection and Implementation

Because the site-wide FS covers approximately 10 miles of the Willamette River (RM 1.9 to 11.8), it was necessary in drafting the FS for EPA to broadly apply remedial technologies on a "conceptual" basis throughout the site based on the existing RI dataset. EPA's recognition in the FS that the various remedial alternatives are "conceptual design[s]" (e.g., FS Sections 3.6.3 through 3.6.8), rather than prescriptive, is very important. The RM11E Group encourages the EPA to choose a remedy in the Proposed Plan and ROD that is also conceptual, i.e., one that allows flexibility at specific locations to modify, as necessary, application of the selected remedial technologies, to take into account existing and newly generated data and the implementability considerations identified at these specific locations.

EPA's FS uses decision trees to assign technologies based on generic sets of conditions. The FS' cost estimates are, in turn, based on the technology assignments. As discussed below, the results

of the RM11E Implementability Study indicate that some technology assignments in the current site-wide FS would not be feasible in parts of the RM11E area. Actual remedy selection for each specific area/subarea of the PHSS will need to address these and other site-specific factors. The process for remedy selection in the Proposed Plan and ROD, and for Remedial Design should therefore anticipate this need and provide flexibility beyond the technology assignment decision trees to effectively address such site-specific factors.

A few specific examples of how the RM11E supplemental RI/FS information shows the need for continued flexibility in the choice of remedial technologies are set out below.

- Underwater Cables and Docks on Steep Slopes Affect Technology Assignments. There is a significant risk that the underwater utility cables and operating docks within RM11E could be damaged or destroyed by the technologies assigned in the site-wide FS. For example, the FS identifies dredging in the navigation channel and designated future maintenance dredging areas (FMD). At RM11E, these areas include the location of buried underwater cables that supply electricity to downtown Portland. While dredging is likely not implementable over the buried cables, there may also be limitations on the ability to cap over the underwater cables given impingement on navigational depth (see attachment at Section 10.2.4.) Similarly, some of the operating docks within the RM11E area are on steep slopes that already have a high degree of potential instability. Portions of the operating dock structures may also be inaccessible for a variety of active remedial action measures. The FS remedies of dredging and/or capping under or around such docks may need to be modified given site-specific circumstances (see attachment at Section 10.2.8).

- Shoreline and Bank Stability Limit Remedial Options. The geotechnical characteristics and bathymetry of RM11E will limit application of some of the current FS technology assignments in the RM11E area. Prescriptive application of technologies set out in the site-wide FS to the RM11E area could result in significant shoreline and bank collapse and create upland structure instability. Two examples are the conceptual discussions in the FS concerning shoreline "layback" and removal of remnant structures.

    - The FS discusses conceptually "laying back" site slopes to a 5H:1V or a 1.7H:1V slope. Some of the existing slopes in the RM11E area are significantly steeper than these slopes, and the space between shoreline structures and navigational areas is very narrow. Accordingly, these slope lay backs are impractical, and perhaps impossible, because they could undermine active, near-shore industrial and commercial infrastructure. It will be important to evaluate, during Remedial Design, how or whether slopes in the RM11E area could be laid back, if at all, without impairing upland structures, navigational access, or both (see attachment at Section 10.2.7.)

    - Remnant structures at RM11E, including large areas of remnant piling, have been evaluated in the Implementability Study. The remnant structures may be providing stability for otherwise over-steepened slopes, in part by being driven into deeper, stable subsurface materials. Accordingly, application of the site-wide FS' presumption that all

remnant structures will be removed (see FS page 3-15) could cause significant unanticipated shoreline and upland slope failure at RM11E (see attachment at Section 10.2.5)

Both of these examples relate to sediment slope and stability (see attachment at Section 10.2.8), which the FS partially addresses in Section 3.3 and Figure 3.3-14b, but that are absent from the technology assignment decision trees in Figures 3.6-1a through 3.6-1c. The Proposed Plan and ROD should acknowledge that site-specific slope and stability challenges will need to be addressed during Remedial Design, and that adjustments are allowable in technology selection, as needed, to address these concerns in specific sub-areas.

- Active Commercial Use of the River Requires Consideration in Selecting Remedial Options at RM11E. The site-wide FS discusses remedial options that will be conceptually applicable to areas affected by navigation (i.e., the navigation channel, FMD, and areas subject to potential propeller wash). The RM11E Implementability Study found that several hundred vessels (ocean going ships, tug boats, and barges) use or traverse the RM11E area every year, with vessels using in-water RM11E facilities almost every day. The type of remedial actions selected, production rates, seasonal timing, costs, and other factors will need to be specifically adjusted during Remedial Design to account for operational site factors, reduce facility closures, and avoid severe economic impacts to waterfront businesses (see attachment at Section 10.2.1).

The objective of the RM11E supplemental RI/FS was to collect data to inform the selection of a remedy, and yet none of it has been incorporated into the site-wide FS. As illustrated above, these pre-engineering assessments, along with other site-specific information that will be generated in Remedial Design, will be critical for choosing an effective and implementable remedy at specific locations within RM11E. The Proposed Plan and ROD should expressly recognize the need for adjustment to the conceptual technology assignments where site-specific conditions so require, and should clearly authorize appropriate adjustments identified through supplementary RI/FS or Remedial Design work.

3. Data Collected as part of Supplemental RI/FS must be used when selecting a Remedy

The site-wide FS does not use data collected by the RM11E Group at EPA's direction to support remedy selection at RM11E. As described above, new sediment data were collected under the RM11E AOC to supplement the existing data and facilitate "expeditious" selection and design of a final remedy at RM11E. The EPA opted not to include these RM11E data in the site-wide FS based on time constraints. The RM11E Group requests that the RM11E data be included in future decision making regarding development of the final remedy, e.g., in the Proposed Plan and the ROD.

Exclusion of the supplemental RI/FS data from RM11E means that contamination footprints presented in the FS do not depict updated conditions in the RM11E area. Thus, the FS application of technologies based on those out of date footprints is likewise not consistent with

actual conditions at RM11E. This will affect the accuracy of cost estimates, and could delay implementation of the remedy if the known RM11E conditions are not included in the Proposed Plan that is issued for public comment or if the ROD is issued without consideration of the data collected as part of the RM11E supplemental RI/FS. These data and examples of how they change FS considerations are summarized below.

The supplemental RI/FS data needs were identified in the RM11E Statement of Work to fill pre-Remedial Design data gaps. These new data are from:

1) Extensive sampling along the river bank that directly affect remedy selection in this challenging part of the RM11E area;
2) Additional surface sediment samples that increase data density and provide updated bounding of the Remedial Action Level footprints;
3) Analysis of sediment samples for organochlorine pesticide using a more accurate analysis method[4] that demonstrates many of the pesticide detections in the RI were significantly overestimated;
4) Re-occupied surface sediment samples that demonstrate concentrations in some areas have decreased; and
5) New high resolution bathymetry data that provide a more complete understanding of shoreline features and the potential for Monitored Natural Recovery.

The RM11E Group requested that EPA include this data in the RI/FS database.[5] The rationale for doing so is provided in the attached December 5, 2014 letter to the EPA. The RM11E Group is disappointed that the data were not included. However, as we move forward, the Group strongly requests that the EPA incorporate the RM11E data in all future activities associated with remedy selection so as to: provide the most accurate, up-to-date information on conditions and remedy selection to the public in the Proposed Plan and ROD; allow for more accurate assessment of technology assignments and remedial costs; and avoid the later perception of changed circumstances and the need for presumptively unnecessary processes.

Conclusion

The RM11E Group supports EPA's efforts to identify an effective and implementable remedial action for the PHSS. Central to that effort is anticipating potential adjustments that will necessarily be required as additional site-specific information is assembled. Providing an efficient administrative process for making those adjustments is critical. Some adjustments will be driven by new sediment data that will result in refined cleanup footprints. Other adjustments will be driven by site-specific factors, such as sediment and slope stability, infrastructure and

[4] The conventional GC/ECD method (EPA 8081A) is subject to interferences when compounds such as polychlorinated biphenyls (PCBs) and other non-target compounds are present. Samples were re-analyzed using the high resolution gas chromatography/tandem mass spectrometry (GC/MS/MS) method (EPA 1699M) to more accurately measure pesticide concentrations.

[5] By new data, we are referring to data collected in 2009 and included in Appendix H of the 2011 Draft RI and data collected pursuant to the RM11E AOC. We are not referring to data collected by other parties.

facility operations, that may require use of different remedial technologies from those identified under the site-wide FS's conceptual technology assignment matrices and flowcharts.

The RM11E supplemental RI/FS work is an excellent case study of the types of adjustments that are likely to be required at the PHSS as we move from the FS level through the ROD to Remedial Design and Remedial Action. New information on major infrastructure, slope stability and operational considerations will require modification to the presumptive technology assignments in the site-wide FS. Similarly, new sediment and river bank data from the RM11E area that is not currently included in the FS data set indicates meaningful changes to the contaminant footprints associated with the RALs established in the site-wide FS. On both fronts, more information is likely to be generated during Remedial Design that will require further adjustments.

The RM11E Group strongly encourages the EPA to incorporate currently available information and data for RM11E in the Proposed Plan and ROD. The RM11E Group also recommends that the EPA anticipate the need for further adjustments to the remedy to accommodate this type of information and data that will be developed. Finally, the RM11E Group recommends that the EPA incorporate into the Proposed Plan and ROD an efficient process for making these adjustments as part of Remedial Design and Remedial Action. Failure to anticipate and allow reasonably foreseeable adjustments to the conceptual remedy would cause unnecessary process and delay, such as generating ESDs or processing ROD Amendments.

The RM11E Group is prepared to discuss the issues addressed above, or to provide any additional information that would be helpful to the EPA or the NRRB in its review of the Portland Harbor remedy.

Sincerely yours,

Jacqueline Thiell Wetzsteon
RM11E Project Coordinator

Attachments:

Implementability Study Report, Chapter 10 (Conclusions and Recommendations) and associated figures
December 5, 2014 letter to Sean Sheldrake re Inclusion of Data from the RM11E Project Area in the PHSS RI/FS Database

ec: Ms. Amy Legare, EPA
Mr. Sean Sheldrake, EPA
River Mile 11E Group
AOC Notice Recipients (Paragraph 97.c through m)

Draft Implementability Study Report

Supplemental
Remedial Investigation/Feasibility Study

River Mile 11 East
Portland, Oregon

July 2015

Prepared for
RM11E GROUP

Prepared by
Dalton, Olmsted & Fuglevand, Inc.
With
David Evans and Associates, Inc.
KPFF Consulting Engineers
Geotechnical Resources, Inc.

9.4 SECTION 9 FIGURES

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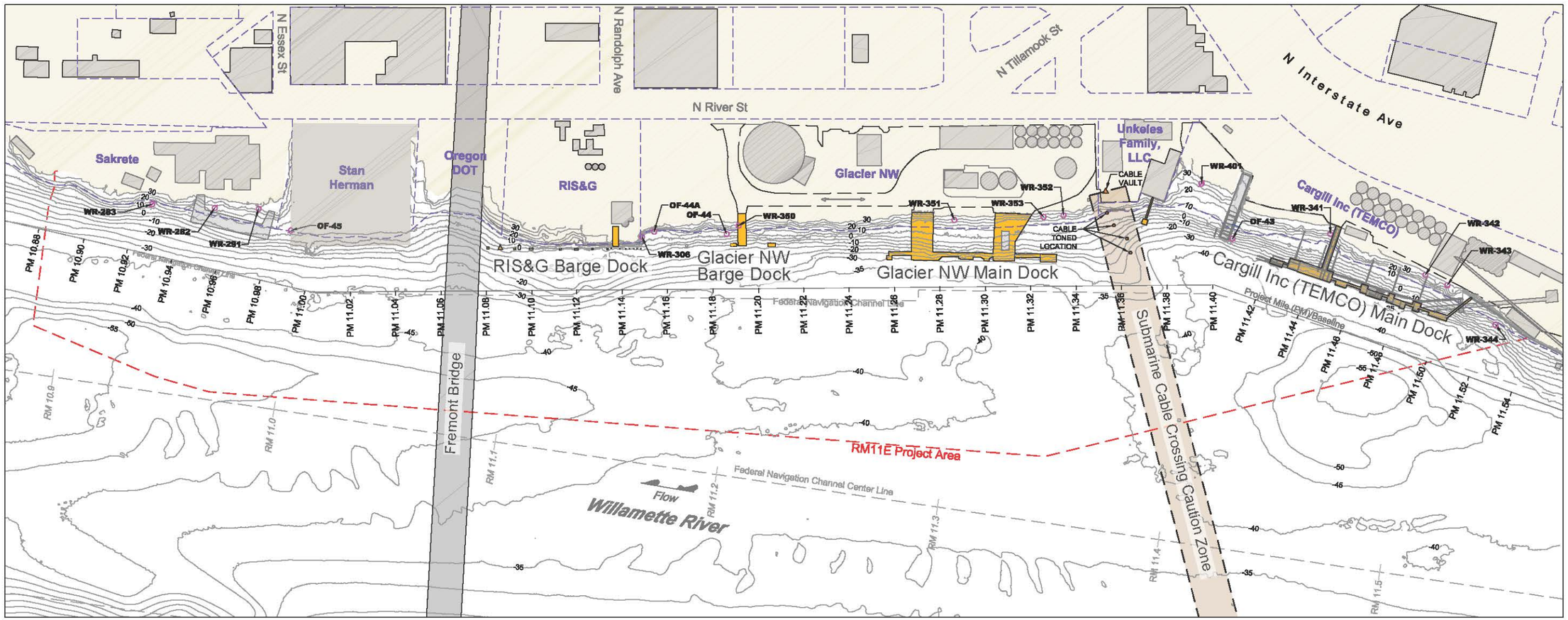

MAP NOTES

1. The locations of all features shown are approximate.
2. Contour lines and planimetric features are based on a composite data set which consists of the following: NOAA multibeam survey from 2009; ODSL multibeam and laser survey from 2010; USACE LiDAR survey from 2009; David Evans and Associates, Inc. multibeam survey from 2011 and terrestrial laser scan from 2013; and RLIS Metro GIS data. Digital elevation model (DEM) surface for bathymetric contours was modeled only in the immediate vicinity of the RM11E Project Area. It is not intended for litigation, construction, or navigation purposes.
3. Horizontal datum is based on Oregon State Plane North NAD83 (international feet). Vertical datum is referenced to NAVD88 (feet).
4. Outfall status and location from City of Portland - Bureau of Environmental Services (BES) GIS group in June 2013. Data layer acquired from GSI. Outfalls centered on coordinates from BES data layer.
5. Tax lot boundary generated by METRO (Oct. 2013). Data layer acquired from GSI.
6. Vertical pile remnants and submarine cable crossing toned location provided by David Evans and Associates, Inc. as described in the Draft Implementability Study Report, Section 2.

LEGEND

- Active Docks (2015)
- Existing Structures
- Submarine Cable Crossing Caution Zone
- Outfall - Active
- Outfall - Inactive or Status Unknown
- RM11E Project Area
- Tax Lot Boundary (Oct. 2013)
- RM 11.3 — River Mile Stationing (USACE)
- PM 11.32 — Project Mile Stationing
- Federal Navigation Channel (USACE)
- 40 — Bathymetric Contour - 5' Interval (NAVD88)

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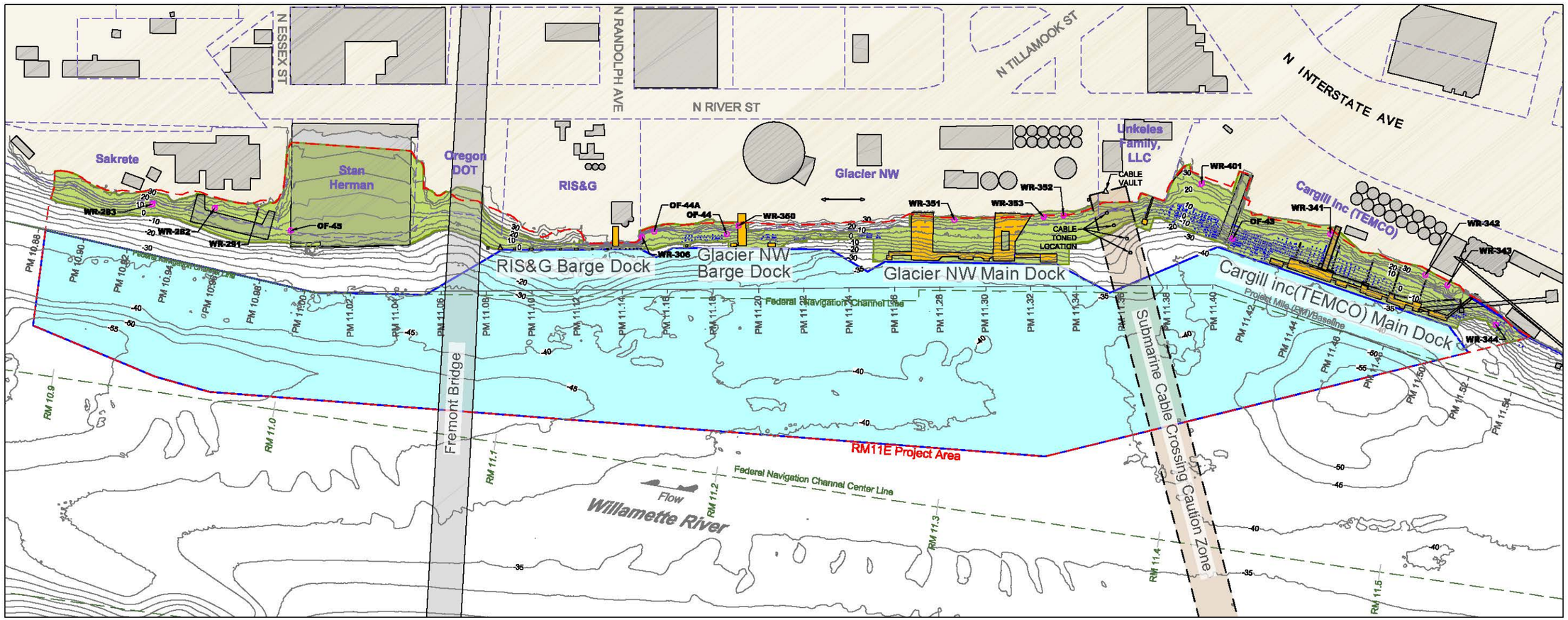
Draft Implementability Study Report

Waterfront Facilities

DALTON OLMSTED FUGLEVAND

Figure 9.1

July 31, 2015



MAP NOTES

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LEGEND

High-Impact Ranking

- Construction Access: High-Impact
- Navigation Clearance/Facility Operations: Moderate- to High-Impact (Cap/Cover)
- Submarine Cable Crossing Caution Zone: High-Impact
- Outfall - Active: Moderate-Impact
- Outfall - Inactive or Status Unknown: Moderate-Impact

Other Features

- Active Docks (2015)
- Existing Structures
- Submarine Cable Crossing Caution Zone
- RM11E Project Area
- Tax Lot Boundary (Oct. 2013)
- RM 11.3 — River Mile Stationing (USACE)
- PM 11.32 — Project Mile Stationing
- Federal Navigation Channel (USACE)
- 40 — Bathymetric Contour - 5' Interval (NAVD88)

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Scale in Feet

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Waterfront Use High-Impact Ranked Areas

(See Figures 3.16a through 3.16d for details)

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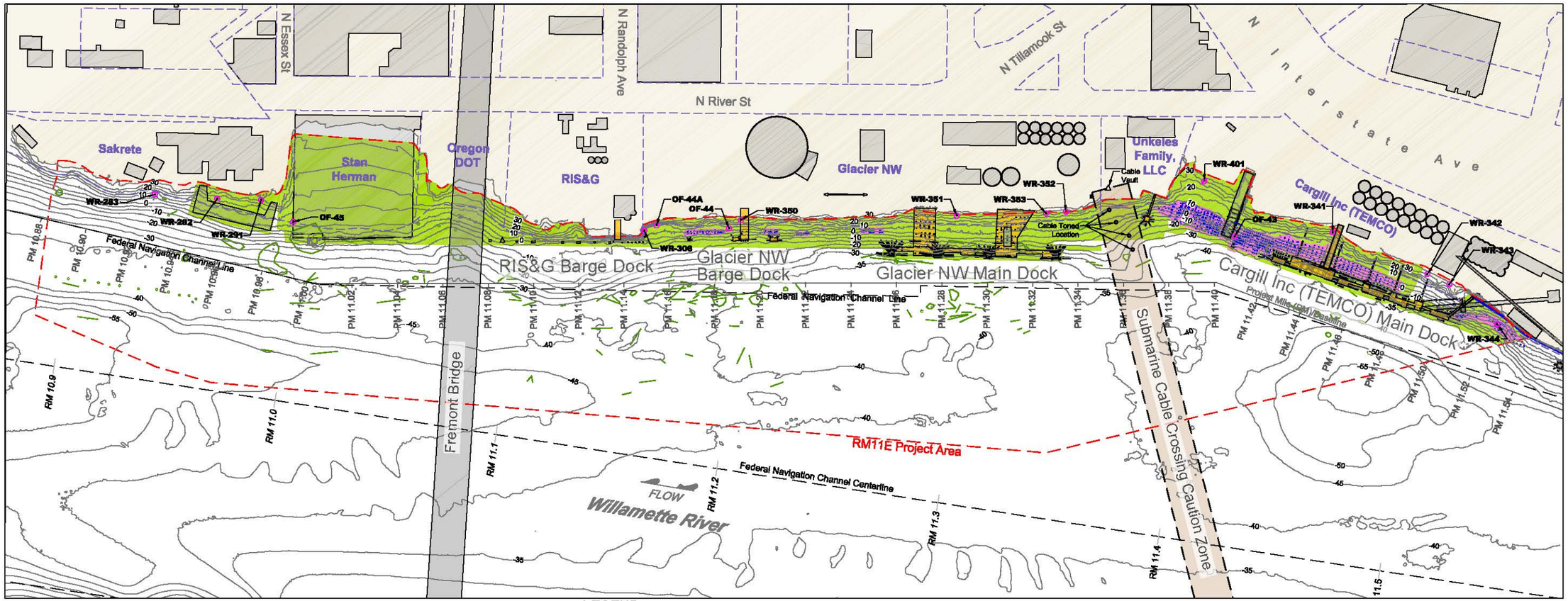
Figure 9.2

July 31, 2015



LEGEND

Impact Ranking

Groups of Vertical Piles: High-Impact (Removal) and Moderate- to High-Impact (Cap/Cover)

Large Undifferentiated Debris: Moderate- to High-Impact (Removal) (Expected within Extents of Historical Shoreline Structures Footprint)

Other Features

- Active Docks (2015)
- Individual Large Debris/Debris Groupings
- Existing Structures
- Submarine Cable Crossing Caution Zone
- Outfall - Active
- Outfall - Inactive or Status Unknown
- RM11E Project Area
- Tax Lot Boundary (Oct. 2013)
- *RM 11.3* River Mile Stationing (USACE)
- PM 11.32 Project Mile Stationing
- Federal Navigation Channel (USACE)
- -40 Bathymetric Contour - 5' Interval (NAVD88)

0 250
Scale in Feet

MAP NOTES

1. While not mapped on this figure, minor undifferentiated debris is possible anywhere on site, and more likely within the footprint of historical buildings and immediately downslope of those buildings.
2. The locations of all features shown are approximate.
3. Contour lines and planimetric features are based on a composite data set which consists of the following: NOAA multibeam survey from 2009; ODSL multibeam and laser survey from 2010; USACE LiDAR survey from 2009; David Evans and Associates, Inc. multibeam survey from 2011 and terrestrial laser scan from 2013; and RLIS Metro GIS data. Digital elevation model (DEM) surface for bathymetric contours was modeled only in the immediate vicinity of the RM11E Project Area. It is not intended for litigation, construction, or navigation purposes.
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7. Vertical pile remnants and submarine cable crossing toned location provided by David Evans and Associates, Inc. as described in the Draft Implementability Study Report, Section 2.

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Debris High-Impact Ranked Areas

(See Figures 4.5a through 4.5d for details)

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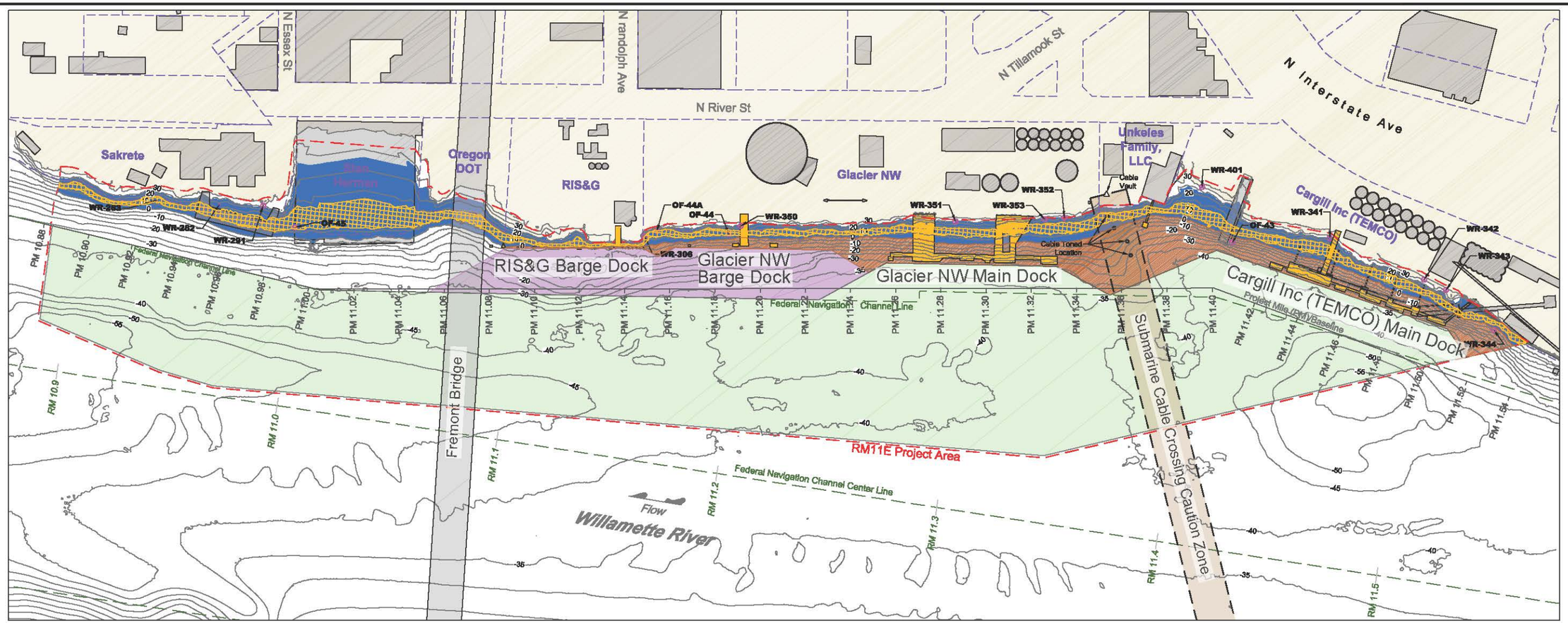
Figure 9.3

July 31, 2015



MAP NOTES

1. Majority of wave force 6' to 13' NAVD88 (Anchor et. al., 2012).
2. The locations of all features shown are approximate.
3. Contour lines and planimetric features are based on a composite data set which consists of the following: NOAA multibeam survey from 2009; ODSL multibeam and laser survey from 2010; USACE LiDAR survey from 2009; David Evans and Associates, Inc. multibeam survey from 2011 and terrestrial laser scan from 2013; and RLIS Metro GIS data. Digital elevation model (DEM) surface for bathymetric contours was modeled only in the immediate vicinity of the RM11E Project Area. It is not intended for litigation, construction, or navigation purposes.
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LEGEND

High-Impact Ranking

- Wave Zone (0.0' to 23.3'): Moderate- to High-Impact (Cap/Cover)
- Majority of Wave Force (6.0' to 13.0'): High-Impact (Cap/Cover)
- Shallow Draft Propeller Wash: Moderate- to High-Impact (Cap/Cover)
- Deep Draft Propeller Wash: Moderate- to High-Impact (Cap/Cover)
- Adjacent Shoreline Propeller Wash: Moderate- to High-Impact (Cap/Cover)

Other Features

- Active Docks (2015)
- Existing Structures
- Submarine Cable Crossing Caution Zone
- Outfall - Active
- Outfall - Inactive or Status Unknown
- RM11E Project Area
- Tax Lot Boundary (Oct. 2013)
- RM 11.3 — River Mile Stationing (USACE)
- PM 11.32 — Project Mile Stationing
- Federal Navigation Channel
- 40 — Bathymetric Contour - 5' Interval

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Scale in Feet

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Willamette River - Portland, Oregon
Implementability Study Report

Hydrodynamics High-Impact Ranked Areas

(See Figures 7.7a through 7.7d for details)

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Figure 9.5

July 15, 2015

PLOT TIME: 7/31/2015 2:00 PM MOD TIME: 7/31/2015 1:55 PM USER: Lee Barras DWG: D:\Projects\RM11E\CAD\Figures\2015-07\NSR\2015-07-31 32 Hydrodynamics Impact Areas Fig 9.5.dwg

MAP NOTES

1. Slope analysis performed by GSI Water Solutions, Inc., September 2014, using ESRI ArcGIS to analyze the DEA Existing Grade composite project surface (DEM) for changes in slope.
2. The locations of all features shown are approximate.
3. Contour lines and planimetric features are based on a composite data set which consists of the following: NOAA multibeam survey from 2009; ODSL multibeam and laser survey from 2010; USACE LiDAR survey from 2009; David Evans and Associates, Inc. multibeam survey from 2011 and terrestrial laser scan from 2013; and RLIS Metro GIS data. Digital elevation model (DEM) surface for bathymetric contours was modeled only in the immediate vicinity of the RM11E Project Area. It is not intended for litigation, construction, or navigation purposes.
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LEGEND

High-Impact Ranking

- Oversteepened Slopes (Slopes Steeper than 2H:1V): High-Impact

Other Features

- Active Docks (2015)
- Existing Structures
- Submarine Cable Crossing Caution Zone
- Outfall - Active
- Outfall - Inactive or Status Unknown
- RM11E Project Area
- Tax Lot Boundary (Oct. 2013)
- RM 11.3 — River Mile Stationing (USACE)
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- 40 — Bathymetric Contour - 5' Interval (NAVD88)

0 250
Scale in Feet

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RM11E Group
Willamette River - Portland, Oregon
Draft Implementability Study Report

Geotechnical High-Impact Ranked Areas

(See Figures 5.6a through 5.6d for details)

DALTON OLMSTED FUGLEVAND

Figure 9.4

July 31, 2015

PLOT TIME: 7/31/2015 2:00 PM MOD TIME: 7/31/2015 1:58 PM USER: Lee Barras DWG: D:\Projects\RM11EC\ADF\Figures\2015-07\NSR\2015-07-31 31 Geotechnical High-Impact Areas Fig 9.4.dwg

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10. CONCLUSIONS AND RECOMMENDATIONS

The conclusions and recommendations in this section are presented for EPA's consideration in its development of the Proposed Remedial Action Plan, presentation to the Remedy Review Board, and development of the ROD as they relate to the RM11E Project Area.

Once PHSS cleanup levels are established in the ROD, the remedial design process can commence to refine areas where remediation will be required and identify viable remedy combinations for the RM11E Project Area based on the engineering assessments conducted to date, the findings of this Implementability Study and post-ROD remedial design efforts.

10.1 REMEDIAL TECHNOLOGIES

As described in Section 9, the remedy for the RM11E Project Area will require combinations of the technologies listed below to provide an effective and implementable remedy across the RM11E Project Area compatible with the complexities posed by the 10 site factors reviewed in Section 9:

- Monitored natural recovery
- Enhanced monitored natural recovery
- In situ treatment
- Engineered capping
- Active capping
- Dredging

10.2 SITE FACTORS

As detailed in Chapters 2 through 9, six engineering assessments have significantly advanced the understanding of the RM11E Project Area and identified the primary site factors to be considered during remedy selection, remedial design, and remedial action. The primary site factors, the issues they pose to implementation, and recommended approaches to mitigate the constraints are summarized below.

The site factors are presented and discussed individually for clarity, but many areas within the RM11E Project Area that may require remediation have multiple site factors to consider. For example, some nearshore subareas will likely be subject to wave action, structural stability issues, oversteepened slopes, groups of vertical piling remnants, and large undifferentiated debris site factors, as well as construction access issues and facility operations issues. Remedial technologies will need to be tailored to accommodate the demands of each subarea.

10.2.1 FACILITY OPERATIONS (FIGURE 9.1)

Conclusions: The ODFW-allowed in-water construction season, which occurs when remediation would normally take place, coincides (and conflicts) with the busiest periods of shipping operations at the RM11E Project Area. Restricting remediation to the in-water work window will cause significant implementability challenges.

Recommendations: With agency authorization, expand the in-water work windows to continue or complete remedial actions outside the period of peak shipping activities. Consider sequentially

remediating portions of the RM11E Project Area using a phased or staged approach, so that remedial work can be coordinated with facility-specific operations.

10.2.2 NAVIGATION CLEARANCE (FIGURE 9.2)

Conclusions: Engineered capping in deep-draft navigation areas (i.e., the navigation channel, deep-draft berths at Glacier NW and Cargill, and associated approach areas) is not likely to be a viable option if the navigation clearances as noted in the PHSS Draft FS are required. Prior to constructing such a cap, it would be necessary to overdredge these areas to depths lower than the riverbed elevation to ensure that navigation clearance is maintained. This dredging would likely result in full removal of impacted material before the desired depth for cap construction is reached, thus negating the need for a cap.

Recommendations: Limit or avoid construction of thick engineering caps in deep-draft navigation areas where navigation clearance cannot be maintained. Revisit the navigation clearance and cap thickness requirements to determine where capping may be viable in navigation areas. In deep-draft navigation areas, consider low-profile remedial solutions, such as MNR, EMNR, in situ treatment, reduced thickness caps, and articulated concrete caps. Implement dredging as a remedial option where engineered capping or low-profile remedies are not viable.

10.2.3 CONSTRUCTION ACCESS (FIGURE 9.2)

Conclusions: Numerous areas within the shoreline and berth area of the RM11E Project Area are not accessible from the water by conventional marine construction equipment or from upland properties because of waterfront structures, groups of vertical pile remnants, shallow draft areas, and steep shorelines.

Recommendations: For caps in locations with limited access, deliver capping material via telescoping conveyor belts or slurry pipelines. For dredging in areas that cannot be accessed otherwise, use shallow-draft marine construction equipment (e.g., small excavator dredges on portable barges) and diver-guided hydraulic dredges Consider implementing remedial actions that require only limited use of marine construction equipment (e.g., MNR, EMNR, in situ treatment).

10.2.4 SUBMARINE CABLE CROSSING (FIGURE 9.2)

Conclusions: The presence of a submarine electrical power cable crossing through the RM11E Project Area precludes dredging as well as anchoring and spudding of marine construction equipment in the cable corridor.

Recommendations: If active remediation is required in the submarine cable crossing caution zone, conduct additional investigation to refine the location and burial depth of the energized cables, to the extent possible. Establish a no-dig zone in the area of the submarine cables. Incorporate remedial actions involving only limited disturbance of sediment (e.g., MNR, EMNR, in situ treatment) in the cable crossing caution zone as well as capping in areas outside of deep-draft navigation.

10.2.5 GROUPS OF VERTICAL PILE REMNANTS (FIGURE 9.3)

Conclusions: Large areas of remnant timber piles exist along the shoreline within the extents of historical shoreline structures, predominantly behind the Cargill main dock, and to a lesser extent north of the Glacier NW main dock. Removal of remnant piles near the shoreline may diminish slope stability and could result in slope failures. Groups of vertical pile remnants limit access for

marine construction equipment, prevent a dredge bucket from achieving complete removal of target sediment, and complicate the placement of a cap by limiting the achievement of a uniform cap thickness. If left in place, piles that extend through the cap could diminish the cap effectiveness.

Recommendations: For caps within groups of vertical pile remnants, consider cutting off piles near the riverbed and increasing cap thickness to account for irregular placement around pile remnants. For dredging within groups of vertical pile remnants, consider diver-operated hydraulic equipment to remove thin deposits of sediment in limited areas. Incorporate MNR, EMNR, and in situ treatment where appropriate.

10.2.6 LARGE UNDIFFERENTIATED DEBRIS (FIGURE 9.3)

Conclusions: Large undifferentiated debris is expected along the shoreline of the RM11E Project area, primarily within the extents of historical shoreline structures. The debris will complicate and diminish the effectiveness of dredging, its removal could potentially destabilize slopes.

Recommendations: In areas where large undifferentiated debris is expected, limit dredging in favor of non-removal technologies (e.g., MNR, EMNR, in situ treatment, engineered capping, and active capping). Where dredging is required, use mechanical dredging and include contingency plans to map debris fields as they are uncovered, and provide for the use of marine construction tools specific to debris recovery. Implement practices to manage turbidity generated during removal of large undifferentiated debris.

10.2.7 OVERSTEEPENED SLOPES (FIGURE 9.4)

Conclusions: Much of the shoreline of the RM11E Project Area is oversteepened and potentially susceptible to slope failure or movement. Dredging or capping could adversely affect slope stability.

Recommendations: Where practical, incorporate remedial technologies that will limit disturbance to the slope (e.g., MNR, EMNR, and in situ treatment). If necessary to cap or dredge in areas where active remediation is required, consider slope stabilization methods such as rock buttressing and retaining walls at the toe of the shoreline slope as well as intermediate retaining walls along the shoreline slope. Evaluate the use of articulated concrete caps in areas of oversteepened slopes, possibly held in place by piles that are driven into deeper stable deposits.

10.2.8 STRUCTURE STABILITY AND CAPACITY (FIGURE 9.1)

Conclusions: Numerous docks and structures in various structural conditions are present throughout the RM11E Project Area. Most are located along the shoreline in areas of oversteepened slopes. Changes to the soil loading conditions due to dredging or capping activities can reduce stability and capacity for these structures. Dredging to remove more than 5 feet of sediment at or near existing structures poses a higher risk to structure stability than does shallower dredging and cap placement.

Recommendations: Limit dredging around structures where possible through application of non-removal remedial technologies (e.g., MNR, EMNR, in situ treatment, engineered caps, and active caps). If necessary and practical, stabilize the slopes and structures to protect the integrity of a structure during and following remediation.

10.2.9 VESSEL PROPELLER WASH (FIGURE 9.5)

Conclusions: Disturbance of sediment and capping material is possible from vessel propeller wash in vessel navigation and berth areas.

Recommendations: Armor engineered caps and active caps in areas of potential propeller wash to protect against erosion. In areas of deep-draft vessel navigation, where navigation clearances render engineered and active capping impractical, consider dredging.

10.2.10 WAVE ACTION (FIGURE 9.5)

Conclusions: Sediment as well as caps placed in the wave zone (elevation 0 to +23 ft. NAVD88) of the RM11E Project Area are subject to erosion from vessel wakes and wind-generated waves.

Recommendations: Armor engineered caps and active caps in the wave zone to protect against erosion. Stabilize slopes where required for capping in areas of oversteepened slopes. Consider dredging in the wave zone.

10.3 SELECTION AND DESIGN OF REMEDIAL TECHNOLOGIES

Recommendations to guide the selection and design of the remedial action for the RM11E Project Area are as follows.

- Provide for the use of multiple combinations of remedial technologies, such as those listed in Section 10.1 to adapt to the many site factors present within the RM11E Project Area.
- As appropriate, conduct remedial actions as distinct subarea projects over a few construction seasons to limit the number of site factors being managed at any one time.
- Provide sufficient flexibility in the final PHSS FS, Proposed Plan, and ROD to allow for use of the RM11E Project Area-specific information for developing implementable and cost-effective designs after issuance of the ROD.

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December 5, 2014

Via E-Mail

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Re: Supplemental RI/FS Work at the River Mile 11E Project Area
Portland Harbor Superfund Site (PHSS)
Inclusion of Data from the RM11E Project Area in the PHSS RI/FS Database

Dear Mr. Sheldrake:

The River Mile 11 East (RM11E) Group, comprised of Cargill, Inc., CBS Corporation, the City of Portland, DIL Trust, Glacier Northwest, Inc., and PacifiCorp, appreciates the discussion it had with the U.S. Environmental Protection Agency (EPA), the Oregon Department of Environmental Quality (DEQ), and the Tribes on November 5, 2014, regarding EPA's use of data collected by the Group pursuant to the Administrative Settlement Agreement and Order on Consent (AOC) for Supplemental Remedial Investigation/Feasibility (RI/FS) Study Work. It is helpful to understand EPA's current position with regard to the potential inclusion or non-inclusion of the collected data in the database for the harbor-wide RI/FS being conducted by the Lower Willamette Group (LWG).[1] Based on that conversation, the RM11E Group understands that EPA's current plan is to include the RM11E data in the site-wide administrative record, but not to include the data in the site-wide RI/FS database. EPA's position appears to be based on the following:

- EPA's perceived need to cut off the inclusion of new data in order to complete the RI/FS in a more timely fashion.

- EPA's belief that the new RM11E data will not have a material impact on the site-wide FS alternatives' cost estimates, based on an analysis recently completed by CDM.

- EPA's concern that the inclusion of the RM11E data would set a precedent that theoretically could apply to data generated as a result of other ongoing investigations.

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[1] At the LWG's request, the RM11E Group has supplied the data it has generated pursuant to the AOC to the LWG.

- EPA's position that the primary objective of the RM11E supplemental AOC Work is to better prepare for remedial design and that the data are not needed to refine the RI/FS prior to issuance of the ROD

While we appreciate EPA's perspective on this issue, the RM11E Group feels strongly that there are compelling reasons to include all of the data from the RM11E AOC Work in the RI/FS database. First, the stated goal of the RM11E AOC Work is to supplement the harbor-wide RI/FS. To supplement is "to enhance or complete," and in this case, what is to be supplemented is the harbor-wide RI/FS. Another stated goal of the RM11E AOC Work is to facilitate selection and design of a remedy. While EPA certainly can and is welcome to use the new data to support pre-design activities, this need not be the only use for the data; rather, the RM11E Group believes the data being collected are well-timed, can be evaluated at the RI/FS stage, and will timely inform remedy selection.

As discussed with EPA during the conference call, incorporating the data into the harbor-wide RI/FS makes sense for the following reasons:

1. The data was collected at the express direction of EPA under an AOC, and the use of the AOC data should be maximized, not minimized, in order to encourage PRP cooperation with EPA.

2. While the data serve as a useful check on cost estimates and contaminant footprints, they can be used in multiple other ways to support the RI/FS. For example, the data set includes new data on COCs such as dioxins and furans and new information downstream of the Freemont Bridge. The collection of this new information was intended specifically to fill gaps in the harbor-wide RI/FS database.

3. Excluding the RM11E data from the comprehensive RI/FS database will lead to inefficiencies and potential confusion in the future. The Portland Harbor site is complex enough as it is without having to run future analyses on multiple databases to capture all the relevant data. Because the RM11E data is directly relevant to the RI/FS, and to all future work to be done at the site, it is appropriate to include it in the database now to streamline all future efforts.

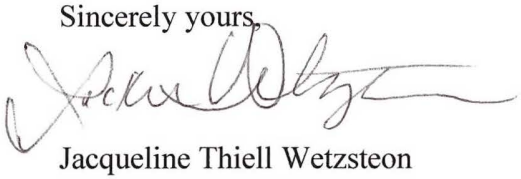
4. EPA acknowledged during the November 5 discussion that the recontamination assessment and implementability studies, once submitted by the RM11E Group, would be evaluated at the FS stage. This use of the data at the FS stage is very appropriate. Making the underlying data for those assessments available in the FS database enhances the credibility and transparency of those studies by allowing the widest access to the data. In contrast, picking and choosing which available data are incorporated and which are not would weaken the apparent transparency of the RI/FS process. It would also potentially discourage PRPs from cooperating with EPA at Superfund sites.

5. It is our understanding that other data generated in conjunction with AOC activities at other areas within Portland Harbor, including NW Natural and Arkema, have just recently been incorporated into the harbor-wide RI/FS database. Consistently approaching the use of data collected pursuant to EPA-approved workplans would enhance, rather than distract, from the process.

We appreciate EPA's serious consideration of our request to include the RM11E data in the final FS and look forward to continuing to engage with EPA and the LWG on this topic.

Please do not hesitate to contact me if you have any questions.

Sincerely yours,



Jacqueline Thiell Wetzsteon
RM11E Project Coordinator

ec: River Mile 11E Respondents
AOC Notice Recipients (Paragraph 97.c through m)
Paul Fuglevand